SS7 failures plague the network; problems traced to DSC upgrade

C. Mason, Washington Editor, and R. Karpinski, Assistant Editor

Two more outages stemming from signaling system 7 equipment from DSC Communications Corp. struck Bell Atlantic last week, this time in Bell Telephone of Pennsylvania's network in Pittsburgh and the vicinity last Monday and Tuesday. Although still being actively investigated at press time, the breakdowns appear to have resulted from the same problem that crippled Bell Atlantic's C&P Telephone network June 26 in Washington, D.C., Maryland, Virginia and West Virginia and, separately, Pacific Bell's network in Los Angeles.

Phone service in western Pennsylvania went down at about 11 a.m. eastern time last Monday and affected about 1 million customers. Tuesday's outage began at about 10:30 a.m. By 12:30 p.m., Bell of Pennsylvania had restored to 53 of 57 central offices.

In addition, Pacific Bell's network suffered a five-minute disruption in the San Francisco area last Monday. Although a telco spokesman could not confirm the cause, he said the failure appeared similar to earlier DSC signal transfer point (STP) related outages. Pacific Bell was able to keep the downtime in the San Francisco outage to a minimum, the spokesman said, because its SS7 nodes in northern California are more sophisticated than those in southern California, and Pacific Bell is "on statewide alert."

Pacific Bell also said last week that it encountered the software problem with a DSC STP on June 10.

But, according to a C&P spokesman, DSC did not advise C&P or Bell Atlantic of the problem. Bellcore, which oversees the analysis of equipment that the Bell regional holding companies use, was not notified either, according to a Bellcore spokeswoman.

It is unclear whether any advance notice would have prevented the ensuing spate of network failures. But if C&P had known about Pacific Bell's problem, it would not have temporarily linked all of its network computers, which it did for the network upgrade in progress at the time of the June 26 failure, a Bell Atlantic Network Services spokesman said. Linking those computers was one reason the C&P outage was so widespread compared to the more localized outages in Los Angeles and Pittsburgh.

A DSC spokesman would neither confirm nor deny whether it told customers about Pacific Bell's problem. But he said that it was company policy not to discuss the details of a customer's network with other customers.

Pacific Bell's June 10 problem, which a telco spokesman described as similar to the June 26 problem, disrupted local service in Los Angeles for about an hour. The outage was caused by a software problem in Pacific Bell's Sherman Oaks SS7 node. The problem, however, did not extend to other SS7 nodes in the area. Although the Sherman Oaks node figured in the June 26 outage, that outage began in Pacific Bell's Los Angeles node and spread from there.

Under normal conditiions the troubled node would have gone out of service to isolate the problem. In the June 26 case, the node continued to send out trouble messages, which overloaded the other nodes.

Investigations are continuing at Bell Atlantic as well. The company initially identified a faulty circuit board as the root of the problem. However, the board failure in Baltimore only became a major problem when the company's SS7 software responded by sending out erroneous data.

Early last week, Bell Atlantic and Bellcore further narrowed the field to DSC STPs that had been recently upgraded. Bell Atlantic investigators believe the problem lies in DSC's generic releases, which appeared in May.

DSC, however, claims there is no one piece of equipment or software at fault and there will be no simple solution. The outages are really an issue of the "network balance" of end offices, tandem switches and STPs, the spokesman said. Telcos now must re-evaluate their current SS7 network architecture schemes, he said.

Nonetheless, all possible reasons for the breakdowns are being examined, including the possibility of a computer virus. The Federal Bureau of Investigation, which investigates computer sabotage, has been notified, according to Bell Atlantic. ∎

Global AT&T plan hits Bell Labs

Richard Karpinski, Assistant Editor

AT&T's aim to become a bigger player in global telecom markets has led to a shake-up at the top of its research arm, AT&T Bell Laboratories.

Ian M. Ross, Bell Labs president since 1979, will step down from that position to devote more of his efforts to broadening AT&T's global reach, the carrier announced last week. Ross, who is one year away from AT&T's mandatory retirement age of 65, was asked by Chairman Robert Allen to spend his final year with AT&T, working closely with Vice Chairman Randall L. Tobias. AT&T re-

cently tapped Tobias to lead its global push *(Telephony, July 1, page 8).*

John S. Mayo, senior vice president for network systems and network services at Bell Labs, will succeed Ross. Mayo, 61, has been overseeing the lab's work in microelectronics technology, transmission systems, switching systems, software-based operations systems and network services development.

Ross will remain president emeritus of Bell Labs, but his ties to Bell Labs will be minimal, according to Mayo.

In a conference call with reporters, Mayo gave a thumbnail sketch of his vision of Bell Labs' future. First and foremost, Bell Labs will remain one of the world's pre-eminent research labs, Mayo said. He pointed to a number of areas to be tapped in the near future: solid-state technology, optical devices—including fiber optics and photonic switching—and computer software.

In addition to developing technologies, Bell Labs will concentrate on working

Ross   *Mayo*